

CLAIMS

- 126
+ 100 +
177
- 10020054-121301
1. A surface coating film for at least partially covering a surface, said coating film comprised of a plurality of nonphotoactive nanoparticles which are present in an amount less than $3 \mu\text{g}/\text{cm}^2$ of the area of the surface.
 2. The film of Claim 1 wherein at least some of said nanoparticles comprise a synthetic mineral.
 3. The film of Claim 1 wherein at least some of said nanoparticles comprise smectite
 4. The film of Claim 1 wherein at least some of said nanoparticles comprise hectorite.
 5. The film of Claim 1 wherein at least some of said nanoparticles comprise fluorohectorite.
 6. The film of Claim 1 optionally containing a non-functional level of binder material.
 7. The film of Claim 1 containing less than 3% peptizer.
 8. The film of Claim 1 consisting essentially of nanoparticles, a wetting agent, and water.
 9. The film of Claim 1 which is substantially continuous.
 10. The film of Claim 1 which is transparent.
 11. The film of Claim 1 having an exposed first surface and a second surface adjacent the surface to which it is applied, wherein said first surface of said film is hydrophilic.
 12. The film of Claim 1 which is less than 300 nanometers thick.
 13. A method of forming a surface coating film for at least partially covering a surface, said method comprising:
 - (a) locating a substrate with a surface;
 - (b) depositing an aqueous composition comprising a plurality of non-photoactive

nanoparticles and a wetting agent on the surface of said substrate, said non-photoactive nanoparticles being deposited in an amount less than 3 $\mu\text{g}/\text{cm}^2$ of the area of the surface; and

(c) allowing said composition to dry without rinsing or agitating the same so that a substantially clear, hydrophilic coating is formed on said surface.

14. The method of Claim 13 wherein said at least some of said nanoparticles are disc-shaped or platelet-shaped, and said disc-shaped or platelet-shaped nanoparticles have at least one dimension that is greater than or equal to about 0.5 nanometers, and an aspect ratio is greater than or equal to about 15.
15. The method of Claim 13 wherein said at least some of said nanoparticles are rod-shaped, and said rod-shaped nanoparticles have at least one dimension that is greater than or equal to about 0.5 nanometers, and an aspect ratio is greater than or equal to about 3.
16. The method of Claim 13 wherein said coating is less than 300 nanometers thick.
17. The method of Claim 13 wherein when said coating at least partially covers a surface that has an initial specular gloss reading before said composition is applied of greater than or equal to 10 at 60° geometry, said surface with said coating thereon has less than or equal to a 10% reduction in specular gloss value when measured at the geometry specified in the Specular Gloss test.
18. The method of Claim 13 wherein when said coating at least partially covers a surface that has an initial specular gloss reading before said composition is applied of less than 10 at 60° geometry, said surface with said coating thereon has an increase of greater than or equal to a 10% in specular gloss value when measured at the geometry specified in the Specular Gloss test.
19. The method of Claim 13 wherein said composition is deposited by spraying the composition onto the surface.
20. The method of Claim 19 wherein said composition is sprayed onto the surface by an electrostatic sprayer.

21. The method of Claim 13 wherein the step (b) of depositing said composition on the surface forms a wet film on said surface.
22. The method of Claim 21 wherein said wet film has less than or equal to 60 defects of a size greater than or equal to 1.75 mm per 100 cm² of the surface as measured at any time more than 30 seconds after the wet film is formed on said surface.
23. The method of Claim 13 wherein the visual dry film score is greater than or equal to (-2).
24. A surface coating film for at least partially covering a surface, said coating film comprised of a plurality of nonphotoactive nanoparticles and water, said film having a water content of less than or equal to about 4%.
25. The film of Claim 24 which is less than 300 nanometers thick.
26. A method of forming a surface coating film for at least partially covering a surface, said method comprising:
- (a) locating a substrate with a surface;
 - (b) depositing an aqueous composition comprising a plurality of non-photoactive nanoparticles and a wetting agent on the surface of said substrate, said non-photoactive nanoparticles being deposited in an amount less than 3 µg/cm² of the area of the surface; and
 - (c) removing water from the coating composition while it is on the surface of said substrate to form a substantially clear, hydrophilic coating on said surface.
27. The method of Claim 26 wherein step (c) comprises heating the air around said coating composition.
28. The method of Claim 26 wherein said aqueous composition is free of binder material.
29. The method of Claim 26 wherein said aqueous composition has a non-functional level of binder material.

30. A method of forming a surface coating film for at least partially covering a surface, said method comprising:

- (a) locating a substrate with a surface;
- (b) depositing an aqueous composition comprising a plurality of non-photoactive nanoparticles and a wetting agent on the surface of said substrate; and
- (c) applying heat at a temperature of greater than 120°C to dry said composition so that a substantially clear, hydrophilic coating is formed on said surface.

31. A method of forming a surface coating film for at least partially covering a surface, said method comprising:

- (a) locating a substrate with a surface;
- (b) depositing an aqueous composition comprising a plurality of non-photoactive nanoparticles and a wetting agent on the surface of said substrate; and
- (c) applying heat for more than 10 minutes to dry said composition so that a substantially clear, hydrophilic coating is formed on said surface.

10020064.121301